Government of Pakistan

National Vocational and Technical Training Commission

Blended International IT Trainings – BIITT 2025

Course Contents/ Lesson Plan

Course Title: IBM Data Analyst Professional Certificate

Duration: 3 Months

NAVTTC HQs, Plot no. 38, Kirthar Road, H-9
Islamabad

Trainer Name	
Course Title	**IBM Data Analyst Professional Certificate**
Objective of Course	Prepare for a career in the **high-growth field of data analytics**. In this program, you'll learn in-demand skills like Python, Excel, and SQL to get job-ready in as little as 4 months. Data analysis is the process of collecting, storing, modeling, and analyzing data that can inform executive decision-making, and the **demand for skilled data analysts has never been greater.** This program will teach you the foundational data skills employers are seeking for entry-level data analytics roles. It will not only help you start your career in data analytics, but also **provides a strong foundation** for future career development in other paths such as data science, artificial intelligence, deep learning, or data engineering. You'll learn the latest skills and tools used by professional data analysts including Excel spreadsheets, Python, Pandas, Numpy, Jupyter Notebooks, Cognos Analytics, and more. You'll work with a variety of data sources and project scenarios to gain practical experience with data manipulation and applying analytical skills. You'll also have the option to learn how generative AI tools and techniques are used in data analysis.
Course Execution Plan	Total Duration of Course: **3 Months (12 Weeks)**
	Class Hours: **3 Hours per day**
	Theory: 30% Practical: 70%
	Weekly Hours: **15 Hours Per week**
	Total Contact Hours: **200 Hours**

Learning Outcome of the Course	Throughout the program, you'll complete hands-on projects and labs and gain a firm grasp on the required technical skills to effectively gather, wrangle, mine, and visualize data, as well as the soft skills for working with stakeholders and storytelling with data to engage your audience. You will: • Master the most up-to-date practical skills and tools that data analysts use in their daily roles • Learn how to visualize data and present findings using various charts in Excel spreadsheets and BI tools like IBM Cognos Analytics & Tableau • Develop working knowledge of Python language for analyzing data using Python libraries like Pandas and Numpy, and invoke APIs and Web Services • Gain technical experience through hands on labs and projects and build a portfolio to showcase your work At the end of the program, you complete a real-world capstone project specifically designed to showcase your newly learned data analyst skills.
Companies Offering Jobs in the respective trade	These companies value hands-on, project-based learning and proven skills in Python, SQL, Excel, Tableau, Power BI, data visualization, and analytics best practices, skills that are central to the IBM Data Analyst Professional Certificate. • Systems Limited • S&P Global • Careem • ibex. Pakistan • Zameen.com • Afiniti • Contour Software • Folio3 • Tkxel • Arbisoft • Netsol Technologies • Qbatch • CureMD • Inbox Business Technologies • Venturedive • Jazz • Freelancing
Job Opportunities	• Data Analyst • Junior Data Analyst • Business Intelligence (BI) Analyst

	• Reporting Analyst • Data Visualization Specialist • Data Quality Analyst • Market Research Analyst • Operations Analyst • Financial Data Analyst • Customer Insights Analyst • Research Assistant (Data-Driven Projects) • Project Data Officer
No of Students	25-30

Learning Place	Labs
Instructional Resources	The following link will be accessible for students once they are enrolled in the program: https://www.coursera.org/professional-certificates/ibm-data-analyst

Scheme of Study

Sr. No	Main Topics	Theory Hrs.	Practical Hrs.	Total Hrs.
1.	**Introduction to Data Analytics**	**12**	**3**	**15**
2.	Excel Basics for Data Analysis / Data Visualization and Dashboards with Excel and Cognos	**4**	**11**	**15**
3.	Data Visualization and Dashboards with Excel and Cognos / Python for Data Science, AI & Development	**4**	**11**	**15**
4.	Python for Data Science, AI & Development	**4**	**11**	**15**
5.	Databases and SQL for Data Science with Python	**4**	**11**	**15**
6.	Databases and SQL for Data Science with Python / Data Analysis with Python	**4**	**11**	**15**
7.	Data Analysis with Python / Data Visualization with Python	**2**	**13**	**15**
8.	Data Visualization with Python / IBM Data Analyst Capstone Project	**2**	**13**	**15**
9.	IBM Data Analyst Capstone Project	**0**	**15**	**15**
10.	IBM Data Analyst Capstone Project / Generative AI: Enhance your Data Analytics Career	**4**	**11**	**15**
11.	Generative AI: Enhance your Data Analytics Career	**6**	**9**	**15**
12.	Data Analyst Career Guide and Interview Preparation	**8**	**7**	**15**
	Total	**54**	**126**	**180**

Scheduled Week	Module Title	Day	Learning Units	Task
Week 1/12	Introduction to Data Analytics	Day 1	What is Data Analytics	Introduction to Visualization and Dashboarding Software
		Day 2	The Data Ecosystem	
		Day 3	Gathering and Wrangling Data / Mining & Visualizing Data and Communicating Results	
		Day 4	Career Opportunities and Data Analysis in Action	
		Day 5	Introduction to Data Analysis Using Spreadsheets / Getting Started with Using Excel Spreadsheets	
Week 2/12	Excel Basics for Data Analysis / Data Visualization and Dashboards with Excel and Cognos	Day 1	Cleaning & Wrangling Data Using Spreadsheets	Cleaning and preparing data, and then analyzing data using an Excel spreadsheet
		Day 2	Analyzing Data Using Spreadsheets	
		Day 3	Final Project	
		Day 4	Visualizing Data Using Spreadsheets	
		Day 5	Creating Visualizations and Dashboards with Spreadsheets	
Week 3/12	Data Visualization and Dashboards with Excel and Cognos / Python for Data Science, AI & Development	Day 1	Creating Visualizations and Dashboards with Cognos Analytics	Creating Visualizations Using Cognos Analytics
		Day 2	Final Project	
		Day 3	Python Basics	
		Day 4	Python Data Structures	
		Day 5	Python Programming Fundamentals	
Week 4/12	Python for Data Science, AI & Development	Day 1	Python Programming Fundamentals - Continued	Develop a data visualization project using Excel and Cognos Analytics
		Day 2	Working with Data in Python	
		Day 3	Working with Data in Python – Continued	
		Day 4	APIs and Data Collection	
		Day 5	APIs and Data Collection – Continued	
Week 5/12	Databases and SQL for Data Science with	Day 1	Getting Started with SQL	Web Scraping / Working with different file formats
		Day 2	Introduction to Relational Databases and Tables	

	Python	Day 3	Intermediate SQL	
		Day 4	Accessing Databases using Python	
		Day 5	Course Assignment	
Week 6/12	Databases and SQL for Data Science with Python / Data Analysis with Python	Day 1	Advanced SQL for Data Engineers	Practice Querying Real World Datasets
		Day 2	Importing Data Sets	
		Day 3	Data Wrangling	
		Day 4	Exploratory Data Analysis	
		Day 5	Model Development	
Week 7/12	Data Analysis with Python / Data Visualization with Python	Day 1	Model Evaluation and Refinement	Data Analytics for House Pricing Data Set
		Day 2	Final Assignment	
		Day 3	Introduction to Data Visualization Tools	
		Day 4	Basic and Specialized Visualization Tools	
		Day 5	Advanced Visualizations and Geospatial Data	
Week 8/12	Data Visualization with Python / IBM Data Analyst Capstone Project	Day 1	Creating Dashboards with Plotly and Dash	Create Visualizations using Matplotlib, Seaborn & Folium
		Day 2	Creating Dashboards with Plotly and Dash – Continued	
		Day 3	Final Project	
		Day 4	Exam	
		Day 5	Data Collection	
Week 9/12	IBM Data Analyst Capstone Project	Day 1	Data Wrangling	Exploratory Data Analysis
		Day 2	Data Wrangling – Continued	
		Day 3	Exploratory Data Analysis	
		Day 4	Data Visualization	
		Day 5	Data Visualization – Continued	
Week 10/12	IBM Data Analyst Capstone Project /	Day 1	Data Visualization – Continued	Complete the IBM Data Analyst Capstone Project and present your
		Day 2	Building A Dashboard	

	Generative AI: Enhance your Data Analytics	Day 3	Final Assignment: Present Your Findings	findings
		Day 4	Final Assignment: Present Your Findings - Continued	
		Day 5	Data Analytics and Generative AI	
Week 11/12	Generative AI: Enhance your Data Analytics Career	Day 1	Data Analytics and Generative AI – Continued	Guided Practice Project
		Day 2	Use of Generative AI for Data Analytics	
		Day 3	Use of Generative AI for Data Analytics - Continued	
		Day 4	Final Project	
		Day 5	Exam	
Week 12/12	Data Analyst Career Guide and Interview Preparation	Day 1	Build a Foundation	Python Exercise for Introductory Data Analysis
		Day 2	Applying and Preparing to Interview	
		Day 3	Interviewing	
		Day 4	Mock Interviews	
		Day 5	Course Wrap-up	

List of Machinery / Equipment

1. Software List

Sr. No	Software Name
1.	MS Office(Installed on each PC)
2.	Operating System (Windows, Linux or other Operating Systems)
3.	Programming Languages including PyCharm, Notebook

2. Minimum Qualification of Teachers / Instructor

The qualification of teachers / instructor of this course should be a minimum of bachelor's in computer science / software engineering with minimum 3 years of development experience in relevant trade.

3. Eligibility for the trainees:

As defined by NAVTTC

4. List of Machinery/Equipment

Sr. No	Name of item as per curriculum	Quantity physically available at the training location
1	Computers Minimum Core-i5 8th Generation ● LCD Display 17" with built in speakers	25
2	DSL Internet Connection (Minimum 5 MB)	Available on every PC
3	**Accessories/Devices** ● Connectors ● Multimedia ● Audio/visual aid ● White Board ● Flip Chart Board	25 each
4	**Wires, data cables, power plugs, power supply**	For every PC
5	**UPS**	Available
6	**Generator / Solar Backup**	Available
7	**Air Conditioner (2 Tons)**	Available